Remarks/Arguments

Attorney for Applicants submits this Letter in response to the Office Action dated October 18, 2007.

With respect to prior election of species, Applicants note Examiner's agreement that Claims 8 and 16 are directed to elected species and, therefore, are being considered herein and are not withdrawn. Applicants again request reconsideration with respect to Claims 5 and 13. The Examiner incorrectly indicates that these claims do not encompass elected species of the first prepolymer (P^A) unit (a) to encompass tetrahydrophthalic anhydride. It is respectfully submitted that each of Claims 5 and 13, as amended, encompass the anhydride when "X and Y together or two G groups together represent -(CH2-C=O)$_X$-D with...D is an oxygen atom and x is 2".

Inclusion of Claims 5 and 13 as part of the elected species is respectfully solicited.

Applicants have amended the Claims to correct certain errors in order to more fully define the claimed invention in accordance with the mandates of 35 USC §112, first paragraph. Withdrawal of the rejection made under 35 USC §112, first paragraph, is respectfully solicited.

Applicants have maintained all claims in the subject application for the Examiner to further consider the rejoining of the claims upon allowance of the present Group I claims.

The presently claimed invention is directed to oxygen scavenging compositions comprising block copolymers having blocks formed from a first pre-

polymer containing cycloalkenyl groups and, further, having blocks formed from second pre-polymer comprising thermoplastic, film forming polymer. The presently claimed block copolymer has been unexpectedly found to act as an oxygen scavenger agent under both ambient, room temperature (ca. 20°C - 30°C) and refrigerated low temperature (ca.< 20°C to -20°C) as well as exhibit a high degree of compatibility with conventional film forming polymers to provide a desired tack-free, haze-free packaging product using conventional processing equipment.

The Examiner has rejected Claims 1, 2, 4, 9, 10 and 12 under 35 USC §103(a) over the teaching of US Patent 6083585 to Cahill et al. ("Cahill et al."). It is respectfully submitted that the presently claimed invention is patently distinct from the teachings of Cahill et al., as discussed herein below. Withdrawal of the rejection is respectfully solicited.

Cahill et al. teach that their barrier product is a polyester resin, such as a linear polyesters of an aromatic dicarboxylic acid component and a diol component. Examples of suitable dicarboxylic acid components given by the reference include terephthalic acid, isophthalic acid, naphthalene dicarboxylic acid, diphenyl ether carboxylic acid, diphenyl dicarboxylic acid, diphenyl sulfone dicarboxylic acid and diphenoxyethanedicarboxylic acid. These dicarboxylic acids are taught to be reacted in conventional manners with diol components such as ethylene glycol, trimethylene glycol, tetramethylene glycol, and the like. The reference teaches that their preferred barrier is polyethylene terephthalate (PET) which can be subjected to transesterification with their oxygen scavenger to provide their copolymer product.

Cahill et al. teach that there barrier is formed with a small amount (0.5 to 12 %) of an oxygen scavenger moiety. Cahill et al. teach that the oxygen scavenger moiety of their copolymer is selected from "polyolefin oligimer...selected from the group consisting of polypropylene, poly(4-methyl)-1-pentene, unhydrogenated polybutadiene, and mixtures thereof." Cahill et al. teach that their resultant copolymer overcomes defects associated with PET and the like polymers, as a gas barrier material, especially when used in thin structure applications.

There are several distinction between the teachings of Cahill et al. and the presently claimed invention.

Firstly, the oxygen scavenger prepolymer required by the present invention is distinct from and not made obvious by the teachings of Cahill et al.

Cahill clearly directs one to form the oxygen scavenger moiety from *linear polyolefin oligomers*... selected from the group consisting of polypropylene, poly(4-methyl)-1-pentene, un-hydrogenated polybutadiene, with polybutadiene being the preferred material. Such class of material is not the subject of the present invention. The presently claimed invention is clearly directed to non-aromatic, cycloalkenyl group containing polymers and to overcoming certain problems associated with such material as oxygen scavengers when formed to have low T_g (e.g. lack of scavenger capacity at low refrigeration temperatures, high tack at room temperatures, difficulty to form into films using conventional apparatus).

Secondly, Cahill et al. directs one to improvement of a gas barrier material by inclusion of small amounts of non-cyclic olefinic oligomers while the present claimed invention is directed to overcoming defects of certain known oxygen scavenger materials that are formed of cycloalkenyl group containing polymers.

The presently claimed polymer is distinct in the class of goods known in the packaging industry. Further, Cahill et al. and Applicants describe distinctly different active oxygen scavenger components, as discussed above. Further, the cited art teaches modifying their material by the addition of only small amounts (0.5 to 12 wt. %) of their non-cyclic oxygen scavenger to form isolated areas of scavenger within their barrier material. Clearly, this teaching directs one to modify the gas barrier material and, therefore, the gas barrier material would be the major component of Cahill et al. product. Further, Cahill et al. specifically teach the use of small amounts of their oxygen scavenger material. Their amounts are smaller than and would not provide sufficient activity in Applicants presently claimed oxygen scavenger material. The present invention is directed to block copolymers having from 20 to 80 weight percent of oxygen scavenger pre-polymer (P^A).

Thirdly, the components used by Cahill et al. teach and suggest distinctly different chemical moieties from the subject pre-polymers (P^A) of the presently claimed invention. The Examiner states that Cahill is directed to forming their polyester

> "via the reaction of cyclohexene containing polymer (Formula I) with a dihydroxy containing polymer (Formula II)(col.7, lines 3-40). The polyester is reacted with an oligomer (second prepolymer) having terminal carboxylic acid groups (Formula III)."

It is submitted that this is not an accurate description of the reference's teachings.

Firstly, Formula I and Formula II are *monomeric* compounds (not polymers) which react together to form the polyester (Formula III) used as the gas barrier product of Cahill et al. This is not the copolymer but, instead, is merely a description of conventional aromatic polyester synthesis. Further, the preferred species of Formula I are taught to be terephthalic acid, isophthalic acid, etc. These are not cyclohexenes but, instead, are *aromatic benzene ring containing monomers* that provide aromatic benzene ring groups in the resultant gas barrier material subject to modification by the reference's teaching. The polyesters of Cahill et al. do not have oxygen scavenging capabilities and can not be deemed to teach nor suggest the oxygen scavenger polymers (P^A) of the present invention.

Secondly, the polyester (Formula III) of Cahill et al. as well as the oxygen scavenger polyolefin (having unsaturation moiety as part of its backbone or branch chain) are distinctly different from and can not be deemed to suggest the improvement of cycloalkenyl group containing oxygen scavenger pre-polymer (P^A) of the presently claimed invention. Merely because Cahill et al. incorporate a small amount of a material having oxygen scavenging properties via a polymer having a distinctly different chemical structure does not provide a motivation to the artisan to an improvement to use a cycloalkenyl group containing polyester oxygen scavenger composition, as is subject to the present invention.

It is respectfully submitted that the teachings of Cahill et al. do not teach nor suggest the presently claimed invention and the rejection made under 35 USC

§103(a) based on this reference should be withdrawn. Such action is respectfully solicited.

The Examiner has rejected Claims 3 and 11 under 35 USC §103(a) over the teachings of Cahill et al. (described above) in view of US 6254803 to Matthews et al. (Matthews et al.). For the reasons stated herein below, it is respectfully submitted that this rejection is unwarranted and should be withdrawn.

The Examiner notes that Cahill fails to disclose the elected species of tetrahydrophthalic anhydride and using said anhydride to form the oxygen scavenger polymer (P^A) of the presently claimed invention. The Examiner seems not to distinguish the teachings to which Cahill et al. are directed versus the invention to which Applicants' claims are directed.

Cahill et al is directed to modifying a conventional polyethylene terephthalate polyester *gas barrier* polymeric material by the addition of small amounts of a non-cyclic, olefinic oxygen scavenger polymer to provide packaging product suitable for thin wall applications (e.g. small bottle formation vs. larger, thicker walled bottle formation). In contrast, the presently claimed invention is directed to modifying a known cycloalkenyl group containing polyester *oxygen scavenger* polymer by using it to form block copolymers with a large amount of high melt temperature film-forming, thermoplastic polymer to provide a resultant product having improved scavenging properties at both ambient and refrigeration conditions. Clearly, the artisan attempting to modify presently claimed polymers of the type defined as P^A in *oxygen scavenging technology* would not be directed look at the *gas barrier technology* of Cahill et al. nor, if observed, would the reference's teaching suggest the present modification

Further, Cahill et al. teach that their copolymer should contain from 0.5 to 12 weight percent of oxygen scavenger polymeric segments. Such teaching would direct one away and not motivate one to include large amounts of blocks of the oxygen scavenger polymeric moiety P^A as well as large amounts of blocks of the

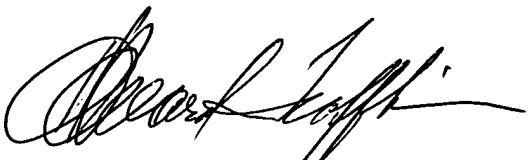
thermoplastic polymer P^B, as required by the presently claimed invention. The presently claimed invention requires P^A to be present in from 20 to 80 weight percent of the block polymer structure with the remainder being formed from P^B. Applicants have shown by the illustrative examples that low amounts of P^A would not retain significant oxygen scavenger capabilities while low amounts of P^B would not impart the enhanced properties of oxygen scavenging and the ability to be formed into films and the like by conventional processing as achieved by the presently claimed film product.

Finally, the claims, as presently amended, require P^B to have high melt temperature (T_m) of higher than 30°C. This is disclosed at page 17, lines 24-25 of the subject application. By utilization of the high melting P^B in the claimed amounts, it has been found that one unexpectedly achieves a desired oxygen scavenger block copolymer having the unique combination of properties described in the present application and claims.

It is respectfully submitted that the art of record does not teach nor suggest the presently claimed invention. Withdrawal of the rejection made under 35 USC 103 over the teaching of Cahill et al in view of Matthey et al is respectfully solicited.

Applicants believe that the Examiner will agree that the presently claimed invention is free from formal and art rejections and, therefore in condition for allowance. Such action is respectfully solicited.

Respectfully submitted,



Howard Troffkin
Attorney for Applicants
Reg. No. 25,184

cc: M.Quatt